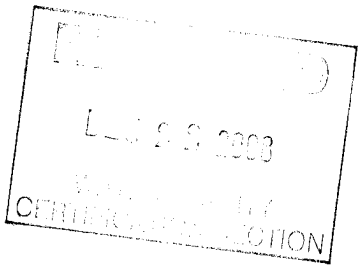
TRANSPORTATION CABINET
Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Joseph W. Prather
Secretary

December 15, 2008



Kentucky Division of Water
ATTN: Jesse Robinson
14 Reilly Road
Frankfort, Kentucky 40601

SUBJECT: **Request for Water Quality Certification**
John Moore Branch Excess Material Site
Pike County, KYTC Item No. 12-0263.72

Dear Mr. Robinson:

Submitted is a request for Water Quality Certification. This project is located in Pike County and involves the development of an excess material site in John Moore Branch. The stream impacts consist of perennial, intermittent, and ephemeral streams and all occur in one HUC 14 area. Mitigation for impacts to U.S. Waters is proposed in the form of in-lieu fees.

This proposed activity once had approved Section 404 and Section 401 permits from the Corps of Engineers (Huntington, WV District) and the Kentucky Division of Water. Please Refer to Corps of Engineers ID #200201446 and KYDOW Water Quality Certification #2003-0076-1. These two permits have expired and the Kentucky Transportation Cabinet is reapplying for Section 404 and Section 401 permits. The scope of the project and proposed stream impacts have not been altered from the previously approved 404 & 401 application submittals. No construction activities related to this project have yet taken place in John Moore Branch.

Enclosed is a permit application for your review. If you have any questions or need additional information, please contact me at (502) 564-7250 or by email at: ronb.rigneyii@ky.gov

Sincerely,

Ronald B. Rigney II

Ronald B. Rigney, II
Permits Coordinator
Division of Environmental Analysis

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES & ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRNOMENTAL PROTECTION
DIVISION OF WATER

APPLICATION FOR PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM AND / OR WATER QUALITY CERTIFICATION

Chapter 151 of the Kentucky Revised Statutes requires approval from the Division of Water prior to any construction or other activity in or along a stream that could in any way obstruct flood flows or adversely impact water quality. *If the project involves work in a stream, such as bank stabilization, dredging or relocation, you will also need to obtain a 401 Water Quality Certification (WQC) from the Division of Water.* This completed form will be forwarded to the Water Quality Branch for WQC processing. The project may not start until all necessary approvals are received from the KDOW. For questions concerning the WQC process, contact the WQC section at 502/564-3410.

If the project will disturb more than 1 acre of soil, you will also need to complete the attached Notice of Intent for Storm Water Discharges, and return both forms to the Floodplain management Section of the KDOW. This general permit will require you to create an implement an erosion control plan for the project.

1. **OWNER: Kentucky Transportation Cabinet**

   MAILING ADDRESS: 200 Mero Street Frankfort, KY 40622

   TELEPHONE #: 502-564-7250 EMAIL: ronb.rigneyii@ky.gov

2. **AGENT: Ronald B. Rigney, II**

   ADDRESS: 200 Mero Street Frankfort, KY 40622

   TELEPHONE #: 502-654-7250 EMAIL: ronb.rigneyii@ky.gov

3. **ENGINEER: N/A P.E. NUMBER: N/A**

4. **DESCRIPTION OF CONSTRUCTION: The purpose of this project is to construct an excess material site in John Moore Branch with material generated from the relocation of US 460 in Pike County. The excess material site will be an engineered fill.**

5. **COUNTY: Pike NEAREST COMMUNITY: Elkhorn City**

6. **USGS QUAD NAME Elkhorn City & Hellier quads LATITUDE/LONGITUDE: 37.309599 / -82.362503**

7. **STREAM NAME: John Moore Branch and unnamed tributaries to John Moore Branch,**

   WATERSHED SIZE (in acres): >250 acres

8. **LINEAR FEET OF STREAM IMPACTED: perennial = 9,939 / intermittent = 6,886 / ephemeral = 4,858**

9. **DIRECTIONS TO SITE: The John Moore Branch excess material site is located approximately 1 mile northwest of Elkhorn city on KY 80 in Pike County.**

   HUC 14 - 05070202030110

10. **IS ANY PORTION OF THE REQUESTED PROJECT NOW COMPLETE? Yes (No) If yes, identify the completed portion on the drawings you submit and indicate the date activity was completed. DATE:**

11. **ESTIMATED BEGIN CONSTRUCTION DATE: ___Spring 2009**

12. **ESTIMATED END CONSTRUCTION DATE: _____2014**

13. **HAS A PERMIT BEEN RECEIVED FROM THE US ARMY, CORPS of ENGINEERS?** Yes (No) If yes, attach a copy of that permit.

14. **THE APPLICANT *MUST* ADDRESS PUBLIC NOTICE:**

(a) PUBLIC NOTICE HAS BEEN GIVEN FOR THIS PROPOSAL BY THE FOLLOWING MEANS:

_____ Public notice in newspaper having greatest circulation in area (provide newspaper clipping or affidavit)

_____ Adjacent property owner(s) affidavits (Contact Division of Water for requirements.)

(b) ____ I REQUEST WAIVER OF PUBLIC NOTICE BECAUSE:

_____

Contact Division of Water for requirements.

15. **I HAVE CONTACTED THE FOLLOWING CITY OR COUNTY OFFICIALS CONCERNING THIS PROJECT:**

_____

Give name and title of person(s) contacted and provide copy of any approval city or county may have issued.

_____

16. **LIST OF ATTACHMENTS: ___summary of impacts, mapping, RBP scoring sheets w/ pictures**

_____

List plans, profiles, or other drawings and data submitted. Attach a copy of a 7.5 minute USGS topographic map clearly showing the project location.

_____

17. **I, _____ (owner) CERTIFY THAT THE OWNER OWNS OR HAS EASEMENT RIGHTS ON ALL PROPERTY ON WHICH THIS PROJECT WILL BE LOCATED OR ON WHICH RELATED CONSTRUCTION WILL OCCUR (for dams, this includes the area that would be impounded during the design flood).**

18. **REMARKS: ___ John Moore Branch excess material site had previous approval of Section 404 and Section 401 permits from the Corps of Engineers (Huntington, WV District) and the Kentucky Division of Water. Please Refer to Corps of Engineers ID #200201446 and KYDOW Water Quality Certification #2003-0076-1. These two permits have expired and the Kentucky Transportation Cabinet is reapplying for Section 404 and Section 401 permits. The scope of the project and proposed stream impacts have not been altered from the previously approved 404 & 401 application submittals. No construction activities related to this project have yet taken place in John Moore Branch.**

I hereby request approval for construction across or along a stream as described in this application and any accompanying documents. To the best of my knowledge, all the information provided is true and correct.

SIGNATURE: Ronald B. Rigney II

Owner or Agent sign here. (If signed by Agent, a Power of Attorney should be attached.)

DATE: 12/12/2008

SIGNATURE OF LOCAL FLOODPLAIN COORDINATOR:

_____

Permit application <u>will</u> be returned to applicant if not properly endorsed by the local floodplain coordinator.

DATE: _____

SUBMIT APPLICATION AND ATTACHMENTS TO:

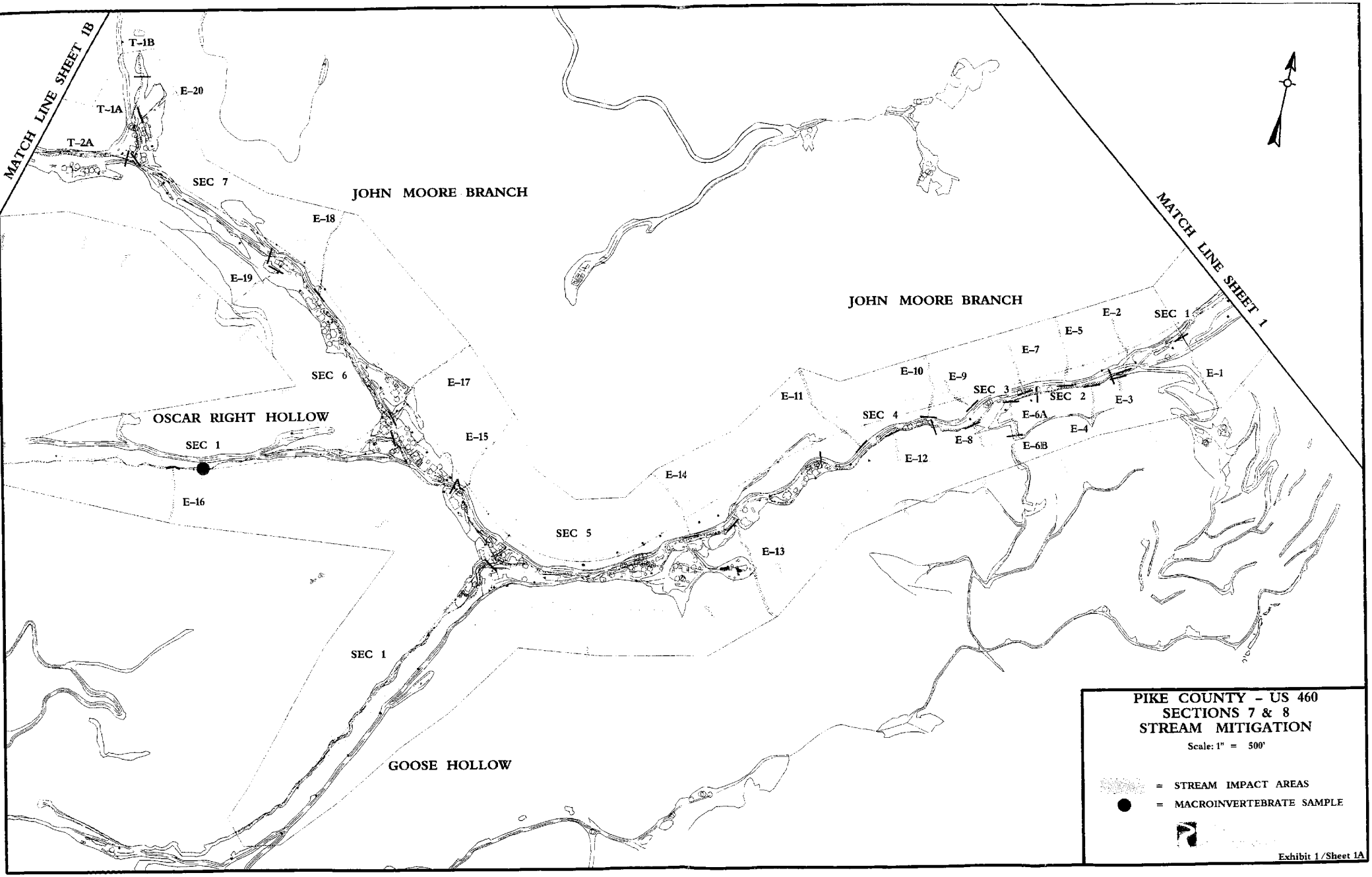
Floodplain Management Section
Division of Water
14 Reilly Road

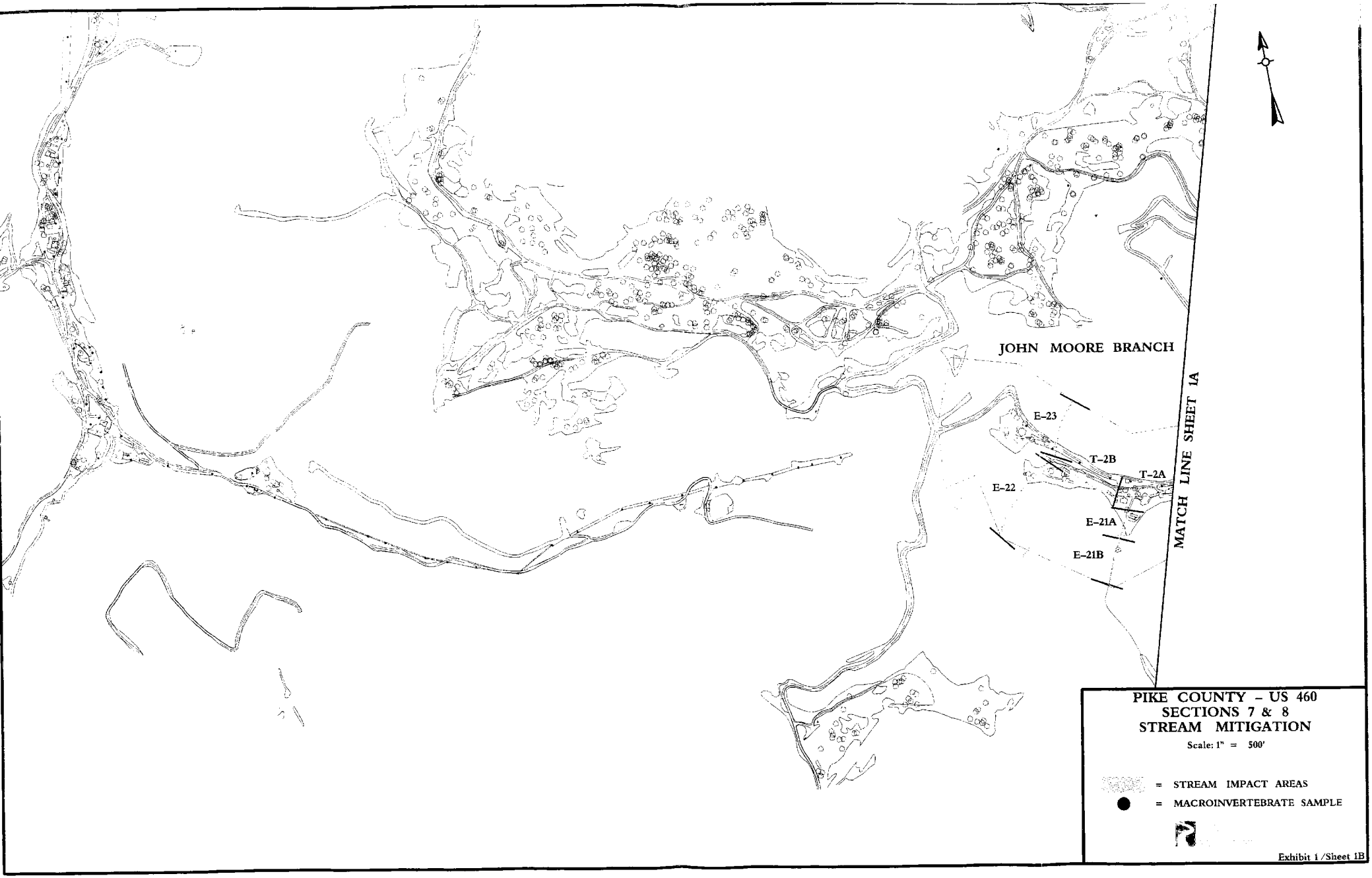
Impact Summary Sheet - US 460 John Moore Branch Excess Material Site

Site Number	Stream Name	Stream Type	Impact Length	Stream Width	Impact Acreage	Conductivity	EII	In-Lieu Fee
1	JMB E1	Ephemeral	264	4.0	0.024	647	0.38	$0.00
2	JMB E2	Ephemeral	217	2.0	0.010	647	0.22	$0.00
3	JMB E3	Ephemeral	73	2.0	0.003	647	0.26	$0.00
4	JMB E4	Ephemeral	100	3.5	0.008	647	0.26	$0.00
5	JMB E5	Ephemeral	220	1.5	0.008	647	0.10	$0.00
6	JMB E6	Ephemeral	179	3.0	0.012	647	0.10	$0.00
7	JMB E7	Ephemeral	171	2.0	0.008	647	0.18	$0.00
8	JMB E8	Ephemeral	143	2.5	0.008	647	0.10	$0.00
9	JMB E9	Ephemeral	180	2.0	0.008	647	0.21	$0.00
10	JMB E10	Ephemeral	152	3.0	0.010	647	0.25	$0.00
11	JMB E11	Ephemeral	400	5.5	0.051	647	0.23	$0.00
12	JMB E12	Ephemeral	176	1.5	0.006	647	0.33	$0.00
13	JMB E13	Ephemeral	369	5.0	0.042	647	0.28	$0.00
14	JMB E14	Ephemeral	224	3.5	0.018	647	0.26	$0.00
15	JMB E15	Ephemeral	281	4.0	0.026	647	0.27	$0.00
16	JMB E16	Ephemeral	64	2.0	0.003	647	0.18	$0.00
17	JMB E17	Ephemeral	370	3.0	0.025	647	0.27	$0.00
18	JMB E18	Ephemeral	467	2.5	0.027	647	0.31	$0.00
19	JMB E19	Ephemeral	132	2.5	0.008	647	0.27	$0.00
20	JMB E20	Ephemeral	153	1.0	0.004	647	0.11	$0.00
21	JMB E21	Ephemeral	181	2.0	0.008	647	0.10	$0.00
22	JMB E22	Ephemeral	245	1.5	0.008	647	0.17	$0.00
23	JMB E23	Ephemeral	97	2.0	0.004	647	0.35	$0.00
24	Goose Hollow	Intermittent	2365	5.0	0.271	647	0.31	$358,253.57
25	Oscar Right	Intermittent	2501	5.0	0.287	224	0.62	$486,198.29
26	JMB Trib #1	Intermittent	670	2.0	0.031	453	0.15	$85,374.00
27	JMB trib #2	Intermittent	1350	3.5	0.108	647	0.13	$167,966.69
28	John Moore Branch	Perennial	8939	6.0	1.231	647	0.18	$1,769,858.64

Ephemeral	4858		0.331			$0.00
Intermittent	6886		0.698			$1,097,792.55
Perrennial	8939		1.231			$1,769,858.64
Total	20683		2.260			$2,867,651.19

* Impacts to ephemeral streams will be mitigated on-site through the creation of drainage channels. The constructed channels will convey storm water runoff and replace the current function of the ephemeral stream(s).


MATCH LINE SHEET 1B
T-1B
T-1A
T-2A
E-20
SEC 7
JOHN MOORE BRANCH
E-18
E-19
SEC 6
E-17
OSCAR RIGHT HOLLOW
SEC 1
E-15
E-16
SEC 5
E-14
E-13
SEC 1
GOOSE HOLLOW
JOHN MOORE BRANCH
MATCH LINE SHEET 1
E-2
SEC 1
E-5
E-7
E-10
E-9
SEC 3
SEC 2
E-1
E-11
SEC 4
E-6A
E-3
E-4
E-8
E-6B
E-12
PIKE COUNTY - US 460
SECTIONS 7 & 8
STREAM MITIGATION
Scale: 1" = 500'
= STREAM IMPACT AREAS
= MACROINVERTEBRATE SAMPLE
Exhibit 1/Sheet 1A



PIKE COUNTY – US 460
SECTIONS 7 & 8
STREAM MITIGATION

Scale: 1" = 500'

= STREAM IMPACT AREAS

= MACROINVERTEBRATE SAMPLE

Exhibit 1 /Sheet 1B

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
****(Family Level Taxonomy - All Habitats)****

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Ephemeral 1**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.38	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	15	no units
2. Embeddedness	14	no units
3. Velocity/Depth Regime	5	no units
4. Sediment Deposition	18	no units
5. Channel Flow Status	1	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	20	no units
8. Bank stability (both combined)	16	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	149	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

Subindex

JOHN MOORE BRANCH EPHEMERAL STREAM 1

29. upstream, Ephemeral 1

30. upstream, Ephemeral 1

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)

(Family Level Taxonomy - All Habitats)

Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	John Moore Branch Ephemeral 2
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.22	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	8	no units
2. Embeddedness	8	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	16	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	18	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	14	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	124	no units

Macroinvertebrate Data - Family Level (All Habitats)			Subindex
11. Family Taxa Richness		# of taxa sampled	
12. Family EPT Richness		# of EPT species sampled	
13. % Ephemeroptera		% Mayflies (0-100)	
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)	
15. mFBI		no units	
	646.7		

JOHN MOORE BRANCH EPHEMERAL STREAM 2

31. upstream, Ephemeral 2

32. upstream, Ephemeral 2

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
****(Family Level Taxonomy - All Habitats)****

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Ephemeral 3**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.26	Ecological Integrity Index (Habitat Integrity + Conductivity)

	Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells		
	RBP Habitat Parameters		
	1. Epifaunal Substrate	7	no units
	2. Embeddedness	9	no units
	3. Velocity/Depth Regime	1	no units
	4. Sediment Deposition	16	no units
	5. Channel Flow Status	0	no units
	6. Channel Alteration	20	no units
	7. Freq. Of Riffles (bends)	18	no units
	8. Bank stability (both combined)	20	no units
	9. Veg. Protection (both combined)	20	no units
	10. Riparian Width (both combined)	20	no units
	Total Habitat Score	131	no units
	[redacted]		
	Macroinvertebrate Data - Family Level (All Habitats)		
	11. Family Taxa Richness		# of taxa sampled
	12. Family EPT Richness		# of EPT species sampled
	13. % Ephemeroptera		% Mayflies (0-100)
	14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
	15. mFBI		no units
	[redacted]		
	[redacted]	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 3

33. upstream, Ephemeral 3

34. upstream, Ephemeral 3

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 4

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.26	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	9	no units
2. Embeddedness	15	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	18	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	17	no units
8. Bank stability (both combined)	11	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	131	no units
		Subindex
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

JOHN MOORE BRANCH EPHEMERAL STREAM 4

35. upstream, Ephemeral 4

36. upstream, Ephemeral 4

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 5

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.10	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units

>>>>>>> Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

1. Epifaunal Substrate	7	no units
2. Embeddedness	10	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	17	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	15	no units
7. Freq. Of Riffles (bends)	14	no units
8. Bank stability (both combined)	6	no units
9. Veg. Protection (both combined)	14	no units
10. Riparian Width (both combined)	12	no units
Total Habitat Score	96	no units

Subindex

[redacted]

Macroinvertebrate Data - Family Level (All Habitats)

11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

[redacted]

[redacted] 646.7

JOHN MOORE BRANCH EPHEMERAL STREAM 5

37. upstream, Ephemeral 5

38. upstream, Ephemeral 5

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation (Revised 2004)**
Stream/Reach:	**John Moore Branch Ephemeral 6**
Assessment Objectives:	

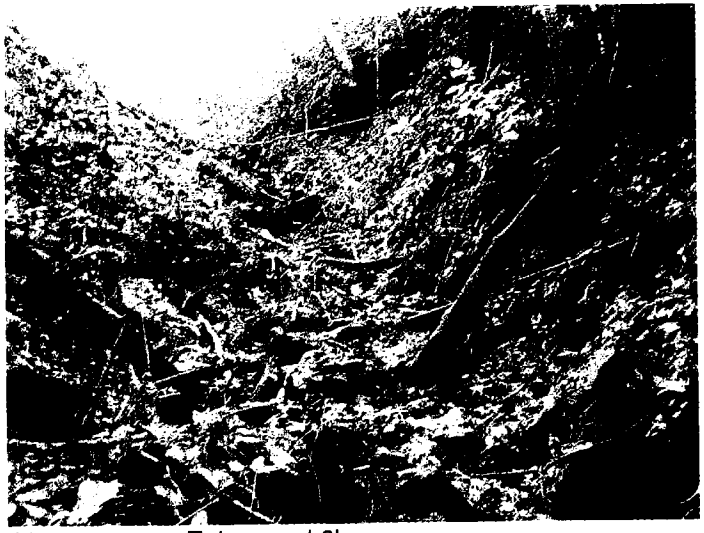
EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0-10	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	8	no units
2. Embeddedness	11	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	16	no units
5. Channel Flow Status	9	no units
6. Channel Alteration	17	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	11	no units
9. Veg. Protection (both combined)	6	no units
10. Riparian Width (both combined)	10	no units
Total Habitat Score	99	no units
		Subindex
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

JOHN MOORE BRANCH EPHEMERAL STREAM 6

39. upstream, Ephemeral 6

40. substrate, Ephemeral 6



41. upstream, Ephemeral 6b

42. substrate, Ephemeral 6b

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
****(Family Level Taxonomy - All Habitats)****

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Ephemeral 7**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.18	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	7	no units
2. Embeddedness	9	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	14	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	18	no units
8. Bank stability (both combined)	11	no units
9. Veg. Protection (both combined)	18	no units
10. Riparian Width (both combined)	18	no units
Total Habitat Score	116	no units

Subindex

Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

	646.7

JOHN MOORE BRANCH EPHEMERAL STREAM 7

43. upstream, Ephemeral 7

44. Ephemeral 7

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

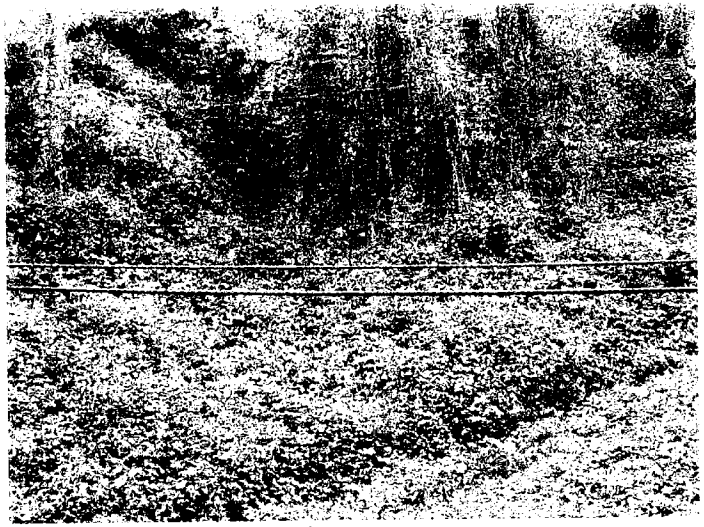
Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	John Moore Branch Ephemeral 8
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.10	Ecological Integrity Index (Habitat Integrity + Conductivity)

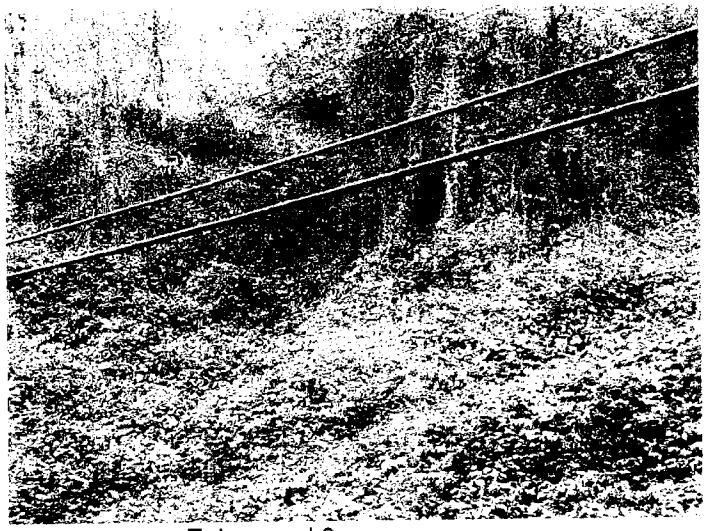
Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	6	no units
2. Embeddedness	10	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	16	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	5	no units
7. Freq. Of Riffles (bends)	16	no units
8. Bank stability (both combined)	14	no units
9. Veg. Protection (both combined)	6	no units
10. Riparian Width (both combined)	10	no units
Total Habitat Score	84	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

Subindex

JOHN MOORE BRANCH EPHEMERAL STREAM 8



45. upstream, Ephemeral 8



46. upstream, Ephemeral 8

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 9

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.21	Ecological Integrity Index (Habitat Integrity + Conductivity)

	Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells		
	RBP Habitat Parameters		
	1. Epifaunal Substrate	6	no units
	2. Embeddedness	9	no units
	3. Velocity/Depth Regime	1	no units
	4. Sediment Deposition	16	no units
	5. Channel Flow Status	0	no units
	6. Channel Alteration	19	no units
	7. Freq. Of Riffles (bends)	19	no units
	8. Bank stability (both combined)	16	no units
	9. Veg. Protection (both combined)	18	no units
	10. Riparian Width (both combined)	17	no units
	Total Habitat Score	121	no units
	Macroinvertebrate Data - Family Level (All Habitats)		
	11. Family Taxa Richness		# of taxa sampled
	12. Family EPT Richness		# of EPT species sampled
	13. % Ephemeroptera		% Mayflies (0-100)
	14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
	15. mFBI		no units
		646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 9

47. upstream, Ephemeral 9

48. upstream, Ephemeral 9

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 10

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.25	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	11	no units
2. Embeddedness	16	no units
3. Velocity/Depth Regime	4	no units
4. Sediment Deposition	16	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	18	no units
7. Freq. Of Riffles (bends)	17	no units
8. Bank stability (both combined)	12	no units
9. Veg. Protection (both combined)	18	no units
10. Riparian Width (both combined)	18	no units
Total Habitat Score	130	no units
[redacted]		Subindex
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
[redacted]		
[redacted]	646.7	

JOHN MOORE BRANCH EPHEMERAL STREAM 10

49. upstream, Ephemeral 10

50. upstream, Ephemeral 10

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	John Moore Branch Ephemeral 11
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.23	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	11	no units
2. Embeddedness	15	no units
3. Velocity/Depth Regime	4	no units
4. Sediment Deposition	12	no units
5. Channel Flow Status	1	no units
6. Channel Alteration	18	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	11	no units
9. Veg. Protection (both combined)	17	no units
10. Riparian Width (both combined)	18	no units
Total Habitat Score	126	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 11

51. upstream, Ephemeral 11

52. upstream, Ephemeral 11

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
****(Family Level Taxonomy - All Habitats)****

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 12

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.33	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	7	no units
2. Embeddedness	17	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	20	no units
5. Channel Flow Status	4	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	17	no units
8. Bank stability (both combined)	17	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	143	no units

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Macroinvertebrate Data - Family Level (All Habitats)

11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

646.7

JOHN MOORE BRANCH EPHEMERAL STREAM 12

53. upstream, Ephemeral 12

54. upstream, Ephemeral 12

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Ephemeral 13**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.28	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	12	no units
2. Embeddedness	14	no units
3. Velocity/Depth Regime	2	no units
4. Sediment Deposition	15	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	13	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	135	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 13

55. upstream, Ephemeral 13

56. upstream, Ephemeral 13

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 14

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.26	Ecological Integrity Index (Habitat Integrity + Conductivity)

	Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells		
	RBP Habitat Parameters		
	1. Epifaunal Substrate	11	no units
	2. Embeddedness	16	no units
	3. Velocity/Depth Regime	2	no units
	4. Sediment Deposition	15	no units
	5. Channel Flow Status	0	no units
	6. Channel Alteration	20	no units
	7. Freq. Of Riffles (bends)	19	no units
	8. Bank stability (both combined)	9	no units
	9. Veg. Protection (both combined)	20	no units
	10. Riparian Width (both combined)	19	no units
	Total Habitat Score	131	no units
	Macroinvertebrate Data - Family Level (All Habitats)		
	11. Family Taxa Richness		# of taxa sampled
	12. Family EPT Richness		# of EPT species sampled
	13. % Ephemeroptera		% Mayflies (0-100)
	14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
	15. mFBI		no units
		646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 14

57. upstream, Ephemeral 14

58. upstream, Ephemeral 14

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	John Moore Branch Ephemeral 15
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.27	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	11	no units
2. Embeddedness	15	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	15	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	13	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	19	no units
Total Habitat Score	133	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 15

59. upstream, Ephemeral 15

60. upstream, Ephemeral 15

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 16

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.18	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	4	no units
2. Embeddedness	6	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	14	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	16	no units
8. Bank stability (both combined)	18	no units
9. Veg. Protection (both combined)	18	no units
10. Riparian Width (both combined)	19	no units
Total Habitat Score	116	no units

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Macroinvertebrate Data - Family Level (All Habitats)

11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

646.7

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
****(Family Level Taxonomy - All Habitats)****

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Ephemeral 17**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.27	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	11	no units
2. Embeddedness	14	no units
3. Velocity/Depth Regime	2	no units
4. Sediment Deposition	15	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	20	no units
8. Bank stability (both combined)	14	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	18	no units
Total Habitat Score	134	no units

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Macroinvertebrate Data - Family Level (All Habitats)

11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

	646.7

JOHN MOORE BRANCH EPHEMERAL STREAM 17

61. upstream, Ephemeral 17

62. upstream, Ephemeral 17

63. culvert, Ephemeral 17

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	John Moore Branch Ephemeral 18
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.31	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	10	no units
2. Embeddedness	17	no units
3. Velocity/Depth Regime	3	no units
4. Sediment Deposition	16	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	20	no units
8. Bank stability (both combined)	16	no units
9. Veg. Protection (both combined)	19	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	141	no units
		Subindex
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

JOHN MOORE BRANCH EPHEMERAL STREAM 18

64. upstream, Ephemeral 18

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)

(Family Level Taxonomy - All Habitats)

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Ephemeral 19**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.27	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	10	no units
2. Embeddedness	15	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	15	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	13	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	133	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 19

65. upstream, Ephemeral 19

66. upstream, Ephemeral 19

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 20

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.11	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	6	no units
2. Embeddedness	6	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	17	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	15	no units
7. Freq. Of Riffles (bends)	15	no units
8. Bank stability (both combined)	14	no units
9. Veg. Protection (both combined)	14	no units
10. Riparian Width (both combined)	14	no units
Total Habitat Score	102	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 20

67. upstream, Ephemeral 20

68. upstream, Ephemeral 20

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
****(Family Level Taxonomy - All Habitats)****

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation (Revised 2004)**
Stream/Reach:	**John Moore Branch Ephemeral 21**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.10	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	4	no units
2. Embeddedness	2	no units
3. Velocity/Depth Regime	0	no units
4. Sediment Deposition	17	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	13	no units
7. Freq. Of Riffles (bends)	11	no units
8. Bank stability (both combined)	18	no units
9. Veg. Protection (both combined)	0	no units
10. Riparian Width (both combined)	0	no units
Total Habitat Score	65	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

Subindex

JOHN MOORE BRANCH EPHEMERAL STREAM 21

69. upstream, Ephemeral 21b

70. upstream, Ephemeral 21b

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 22

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0-17	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	3	no units
2. Embeddedness	10	no units
3. Velocity/Depth Regime	1	no units
4. Sediment Deposition	16	no units
5. Channel Flow Status	0	no units
6. Channel Alteration	16	no units
7. Freq. Of Riffles (bends)	18	no units
8. Bank stability (both combined)	14	no units
9. Veg. Protection (both combined)	18	no units
10. Riparian Width (both combined)	18	no units
Total Habitat Score	114	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

Subindex

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Ephemeral 23

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.35	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	12	no units
2. Embeddedness	17	no units
3. Velocity/Depth Regime	2	no units
4. Sediment Deposition	17	no units
5. Channel Flow Status	1	no units
6. Channel Alteration	20	no units
7. Freq. Of Riffles (bends)	19	no units
8. Bank stability (both combined)	18	no units
9. Veg. Protection (both combined)	20	no units
10. Riparian Width (both combined)	20	no units
Total Habitat Score	146	no units
[redacted]		
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
[redacted]		
[redacted]	646.7	

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JOHN MOORE BRANCH EPHEMERAL STREAM 23

71. upstream, Ephemeral 23

72. substrate, Ephemeral 23

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: Goose Hollow (John Moore Branch)

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.81	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units

>>>>>>> Enter quantitative or categorical measure from Field Data Sheet in shaded cells

RBP Habitat Parameters

1. Epifaunal Substrate	16	no units
2. Embeddedness	15	no units
3. Velocity/Depth Regime	6	no units
4. Sediment Deposition	15	no units
5. Channel Flow Status	11	no units
6. Channel Alteration	14	no units
7. Freq. Of Riffles (bends)	16	no units
8. Bank stability (both combined)	15	no units
9. Veg. Protection (both combined)	18	no units
10. Riparian Width (both combined)	15	no units
Total Habitat Score	141	no units

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Macroinvertebrate Data - Family Level (All Habitats)

11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

[redacted]

[redacted]

646.7

In-Lieu Fee Compensatory Mitigation Calculator (Version 2002.8)

Intermittent Streams

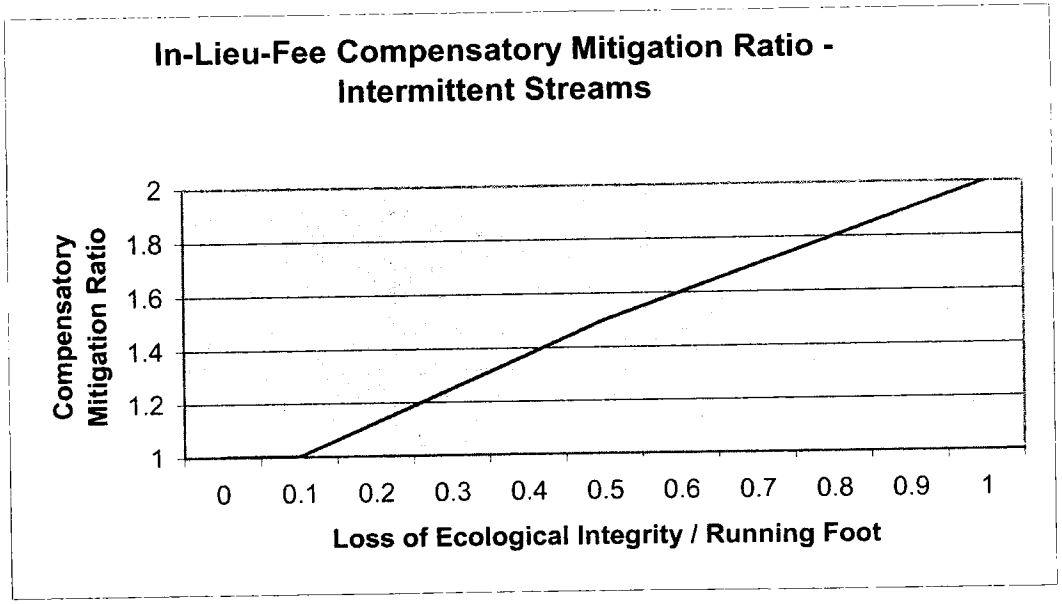
Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	**Goose Hollow Stream 1**

Loss of Ecological Integrity/running ft due to Project Impacts = 0.31 **UNITS** EII (0-1)

Impact Length = 2364.71 **(ft)**

[redacted]

*(adjusted to offset cumulative impacts)



GOOSE HOLLOW (JOHN MOORE BRANCH) INTERMITTENT STREAM

15. substrate, Goose Hollow

16. downstream, Goose Hollow

17. upstream, Goose Hollow

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: Oscar Right Hollow (John Moore Branch)

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.52	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	16	no units
2. Embeddedness	16	no units
3. Velocity/Depth Regime	6	no units
4. Sediment Deposition	15	no units
5. Channel Flow Status	12	no units
6. Channel Alteration	14	no units
7. Freq. Of Riffles (bends)	17	no units
8. Bank stability (both combined)	16	no units
9. Veg. Protection (both combined)	12	no units
10. Riparian Width (both combined)	12	no units
Total Habitat Score	136	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	224	

Subindex

In-Lieu Fee Compensatory Mitigation Calculator (Version 2002.8)

Intermittent Streams

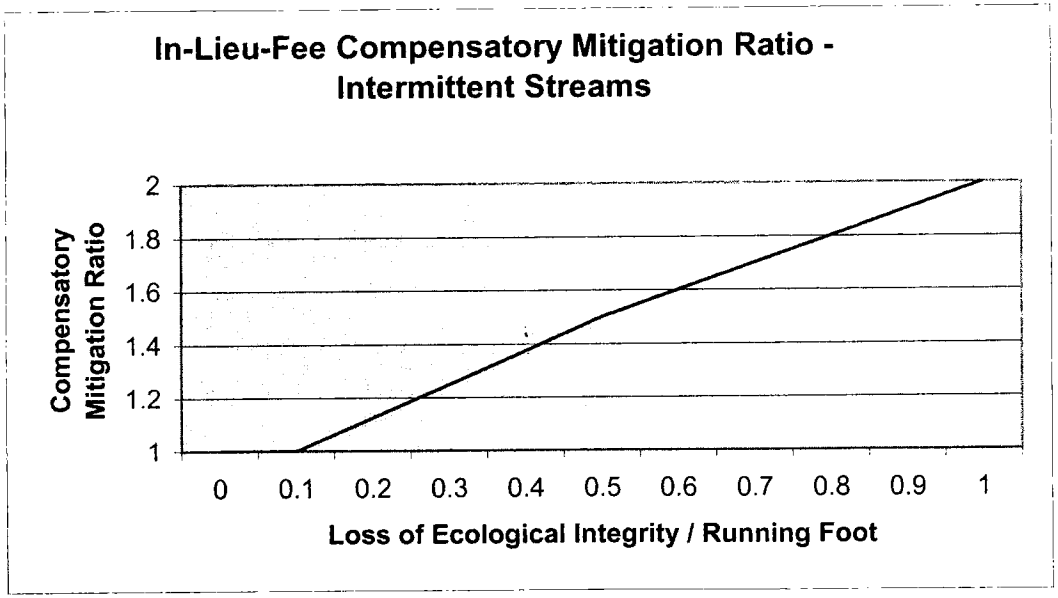
Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	**Oscar Right Stream 1**

Loss of Ecological Integrity/running ft due to Project Impacts = 0.62 **UNITS** EII (0-1)

Impact Length = 2501.02 **(ft)**

[redacted]

*(adjusted to offset cumulative impacts)



OSCAR RIGHT HOLLOW (JOHN MOORE BRANCH) INTERMITTENT STREAM

18. upstream, Oscar Right

19. downstream, Oscar Right 1

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch Tributary 1

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.45	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	2	no units
2. Embeddedness	3.5	no units
3. Velocity/Depth Regime	4.2	no units
4. Sediment Deposition	7.6	no units
5. Channel Flow Status	7.2	no units
6. Channel Alteration	6.4	no units
7. Freq. Of Riffles (bends)	12.7	no units
8. Bank stability (both combined)	1.2	no units
9. Veg. Protection (both combined)	1.9	no units
10. Riparian Width (both combined)	1.9	no units
Total Habitat Score	48.6	no units

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Macroinvertebrate Data - Family Level (All Habitats)

11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units

453

In-Lieu Fee Compensatory Mitigation Calculator (Version 2002.8)

Intermittent Streams

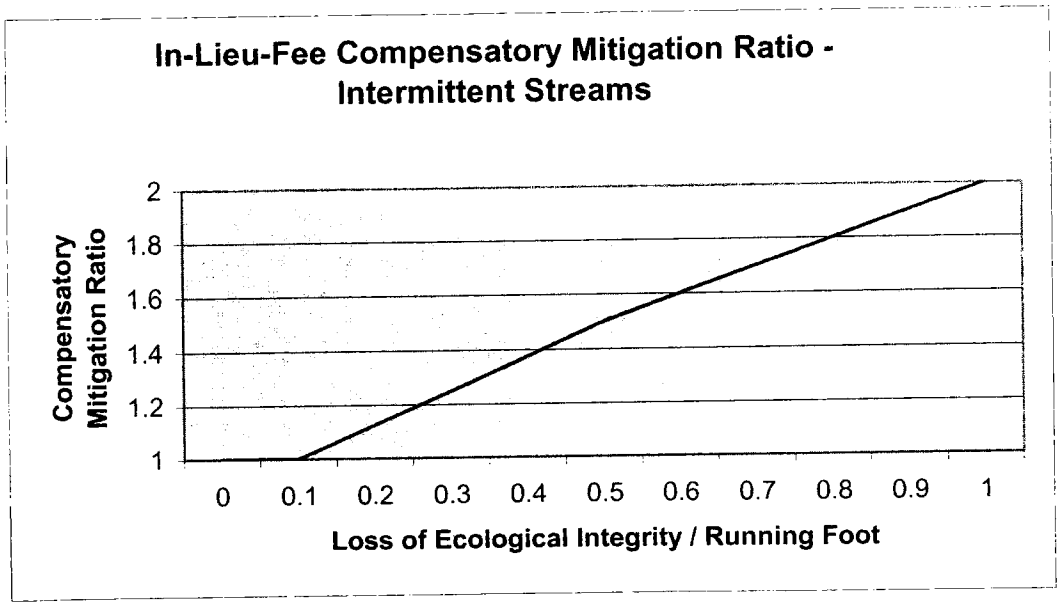
Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	**John Moore Branch Tributary 1**

Loss of Ecological Integrity/running ft due to Project Impacts = 0.15 **UNITS** EII (0-1)

Impact Length = 669.6 **(ft)**

[redacted]

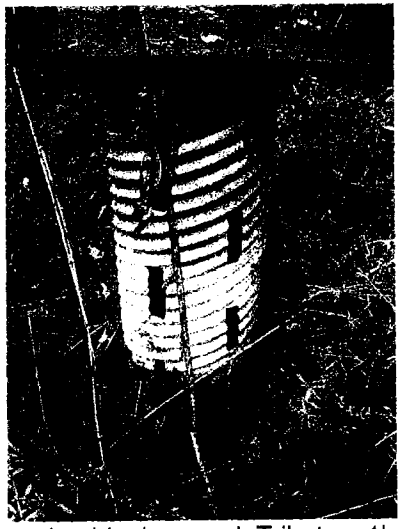
***(adjusted to offset cumulative impacts)**



JOHN MOORE BRANCH INTERMITTENT TRIBUTARY 1

20. downstream, Tributary 1a

21. upstream, Tributary 1a



22. culvert in old mine pond, Tributary 1b

23. channel into culvert, Tributary 1b

JOHN MOORE BRANCH INTERMITTENT TRIBUTARY 1

24. culvert out of old mine pond, Tributary 1b

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)

(Family Level Taxonomy - All Habitats)

Project ID:	**US 460 Sections 7 and 8 Stream Mitigation**
Stream/Reach:	**John Moore Branch Tributary 2**
Assessment Objectives:	

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.13	Ecological Integrity Index (Habitat Integrity + Conductivity)

	Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells		
	RBP Habitat Parameters		
	1. Epifaunal Substrate	12	no units
	2. Embeddedness	12	no units
	3. Velocity/Depth Regime	6	no units
	4. Sediment Deposition	14	no units
	5. Channel Flow Status	7.7	no units
	6. Channel Alteration	12.7	no units
	7. Freq. Of Riffles (bends)	16	no units
	8. Bank stability (both combined)	11.3	no units
	9. Veg. Protection (both combined)	8.4	no units
	10. Riparian Width (both combined)	6.7	no units
	Total Habitat Score	106.8	no units
	Macroinvertebrate Data - Family Level (All Habitats)		
	11. Family Taxa Richness		# of taxa sampled
	12. Family EPT Richness		# of EPT species sampled
	13. % Ephemeroptera		% Mayflies (0-100)
	14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
	15. mFBI		no units
		646.7	

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In-Lieu Fee Compensatory Mitigation Calculator (Version 2002.8)

Intermittent Streams

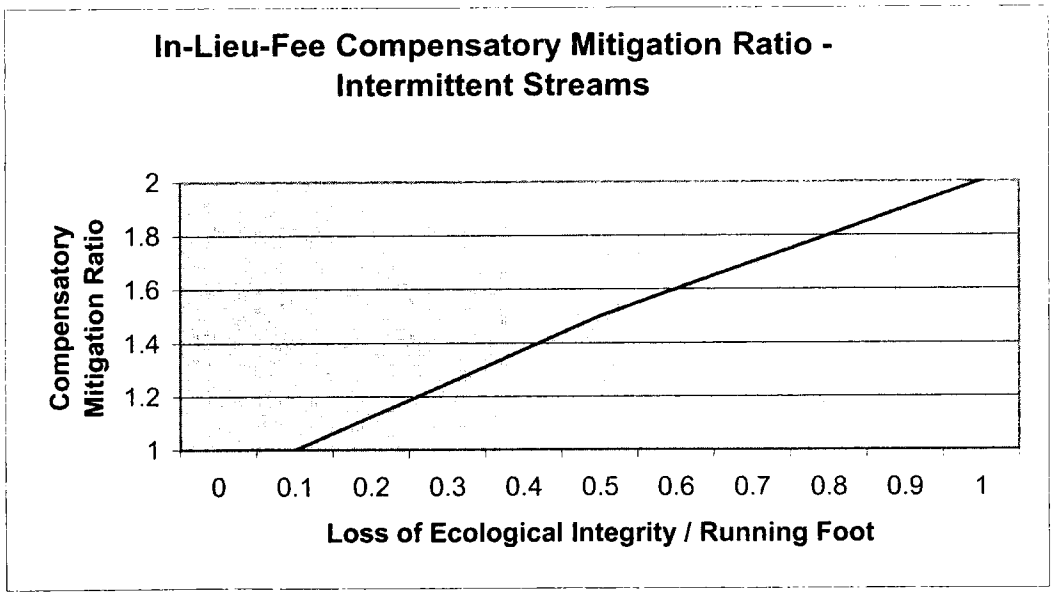
Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	**John Moore Branch Tributary 2**

Loss of Ecological Integrity/running ft due to Project Impacts = 0.13 **UNITS** EII (0-1)

Impact Length = 1349.13 **(ft)**

[redacted]

*(adjusted to offset cumulative impacts)



JOHN MOORE BRANCH INTERMITTENT TRIBUTARY 2

25. downstream, Tributary 2a

26. upstream, Tributary 2a

27. downstream, Tributary 2b

28. downstream, Tributary 2b

EII Calculation for High Gradient Streams in Eastern Kentucky Coalfield (Version 2002.6)
(Family Level Taxonomy - All Habitats)

Project ID: US 460 Sections 7 and 8 Stream Mitigation

Stream/Reach: John Moore Branch

Assessment Objectives:

EII	Model
NA	Ecological Integrity Index (MBI + Habitat Integrity + Conductivity)
0.18	Ecological Integrity Index (Habitat Integrity + Conductivity)

Variables	Measure	Units
>>>>>>>	Enter quantitative or categorical measure from Field Data Sheet in shaded cells	
RBP Habitat Parameters		
1. Epifaunal Substrate	14	no units
2. Embeddedness	13	no units
3. Velocity/Depth Regime	8.7	no units
4. Sediment Deposition	13.3	no units
5. Channel Flow Status	10.6	no units
6. Channel Alteration	11.8	no units
7. Freq. Of Riffles (bends)	16.5	no units
8. Bank stability (both combined)	12.8	no units
9. Veg. Protection (both combined)	8.3	no units
10. Riparian Width (both combined)	7	no units
Total Habitat Score	116	no units
Macroinvertebrate Data - Family Level (All Habitats)		
11. Family Taxa Richness		# of taxa sampled
12. Family EPT Richness		# of EPT species sampled
13. % Ephemeroptera		% Mayflies (0-100)
14. % Chironomidae & Oligochaeta		% Midges & Worms (0-100)
15. mFBI		no units
	646.7	

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In-Lieu Fee Compensatory Mitigation Calculator (Version 2002.8)

Perennial Streams

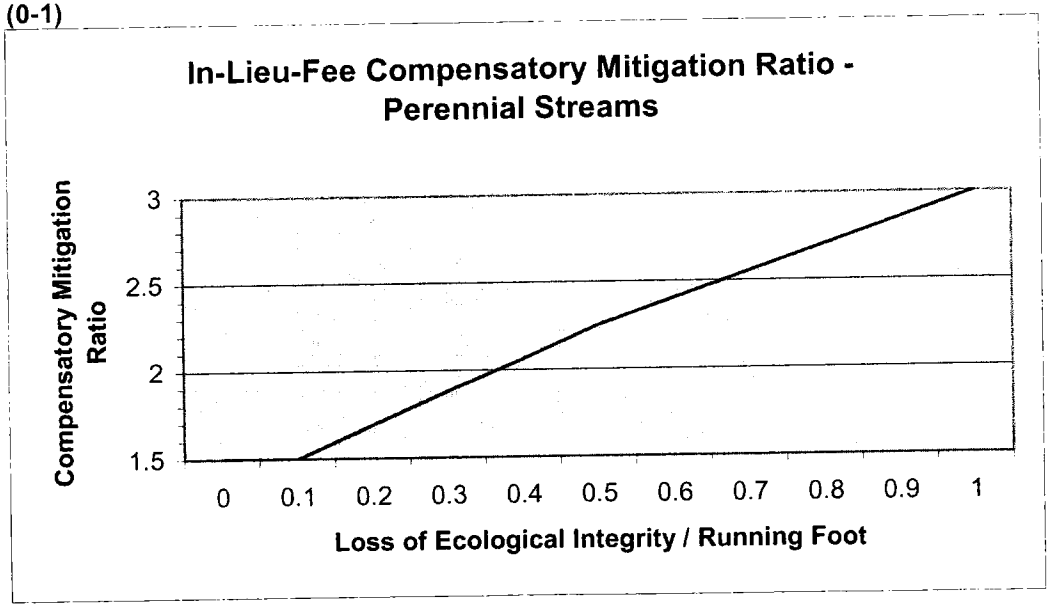
Project ID:	US 460 Sections 7 and 8 Stream Mitigation
Stream/Reach:	**John Moore Branch**

Loss of Ecological Integrity/running ft due to Project Impacts = 0.18 **UNITS** EII (0-1)

Impact Length = 8938.68 **(ft)**

[redacted]

***(adjusted to offset cumulative impacts)**



JOHN MOORE BRANCH PERENNIAL STREAM

1. downstream, Section 1

2. upstream, Section 1

3. upstream, Section 1

4. upstream, Section 2

JOHN MOORE BRANCH PERENNIAL STREAM

5. substrate, Section 2

6. downstream, Section 2

7. upstream, Section 3

8. downstream, Section 3

JOHN MOORE BRANCH PERENNIAL STREAM

9. downstream, Section 4

10. upstream, Section 4

11. downstream, Section 6

12. upstream, Section 6

JOHN MOORE BRANCH PERENNIAL STREAM

13. downstream, Section 7

14. upstream, Section 7